INDIVIDUAL SATISFACTION WITHIN EUROPEAN FAMILIES: DETERMINANTS AND INTERRELATIONS

INMACULADA GARCIA, JOSÉ ALBERTO MOLINA and MARIA NAVARRO*

.

Abstract

This paper first identifies the determinants of income satisfaction of individuals within the household and, secondly, characterises whether their preferences are altruistic or egoistic. To that end, it formulates a theoretical framework from the collective family model whose stochastic formulations are estimated for 14 EU countries by using the eight waves of the European Community Household Panel-ECHP (1994-2001). After showing that the IV Hausman-Taylor procedure is the selected estimation method in the majority of cases, empirical results reveal that wives show altruistic behaviour in more countries than husbands, with the Southern European countries (Greece, Portugal and Spain) being the only ones that show altruistic behaviour in both the male and female satisfaction variables with respect to wage and non-wage incomes.

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Correspondence: María Navarro. Department of Economic Analysis, University of Zaragoza, Zaragoza, Spain. Phone: 34 976 761000 Ext.: 4728, Fax: 34 976 761996, E-mail: navarrop@unizar.es

I. INTRODUCTION

Quite apart from the fact that the general satisfaction of individuals has been extensively studied by psychologists (Diener et al., 1999; Kahnemann et al., 1999), the existing state of research also suggests that reported subjective well-being is a satisfactory empirical approximation to individual utility that can be applied in socio-economic research (Oswald, 1997; Easterlin, 2002; Frey and Stutzer, 2002; Hamermesh, 2004). On this basis, the two areas of general or life satisfaction that have mainly been the subject of economic analysis are probably those which study the relationship between this satisfaction and income, on the one hand, and of the consequences on well-being of being unemployed, on the other. With respect to the former, a significant positive association has been found, specifically with respect to relative income (Easterlin, 1973, 1995, 2001; Clark and Oswald, 1996; Alesina et al., 2001; Blanchflower and Oswald, 2001; Frey and Stutzer, 2002; Frijters et al., 2005) and, as regards the latter, the literature has conclude that unemployment represents a significant and negative determinant in the life satisfaction of individuals (Clark and Oswald, 1994; Darity and Goldsmith, 1996; Korpi, 1997; Theodossiou, 1998; Winkelmann and Winkelmann, 1998; Frey and Stutzer, 1999; Di Tella et al., 2001; Ahn et al., 2004).

In addition to the study of this general or life satisfaction, two particular aspects of individual satisfaction that have been the subject of quite extensive analysis in the literature are satisfaction derived from income and satisfaction with respect to one's job. As regards the first of these, the evidence adduced to date has shown that age, education or, obviously, individual income appear to have significantly positive impacts on the income satisfaction of both spouses (Burkhauser et al., 1997; Osberg and Sharpe, 2002; Bonke and Browning, 2003; Ferrer-i-Carbonell and Van Praag, 2003;Schwarze, 2003; Clark et al., 2004; D'Ambrosio and Frick, 2004). For its part, the literature devoted to job satisfaction has essentially examined the effect of wages and workplace conditions on job satisfaction, with a significant positive

association being found between earnings and job satisfaction (Clark and Oswald, 1996; Clark, 1999; Groot and Maassen van den Brink, 1999; Grund and Sliwka, 2001; Linz, 2003; Ahn and García, 2004).

When this complete body of literature is viewed as a whole, it emerges that the family has traditionally been considered as an element which influences the satisfaction level of its members, with this usually taking the form of a marital status variable. In fact, changes in marital status are among the most imporant transitions in the social life of adults, with widowhood and divorce being regarded as the two most stressful events in adult life, ever more stressful in their nature than going to jail (Holmes and Rahe, 1967). Thus, divorce, *caeteris paribus*, has been shown to have a very significant negative contemporaneous effect on individual satisfaction. By contrast, the positive relationship between marriage and subjective satisfaction has been determined as clearly robust, that is to say, it is not limited to certain populations and does not disappear when a variety of other socio-economic variables, such as age or income, are controlled (Lee et al., 1991; Clark and Oswald, 1994, 2002; Diener et al., 2000; Groot and Maassen van den Brink, 2002).[1]

Despite the clear relevance of the evidence adduced to support this, satisfaction has usually been studied in a way that does not reflect the fact that the family is composed of interdependent spouses between whom there can be found either altruistic or egoistic links. In this way, the intitutive interrelations which can be assummed in reported satisfaction levels among members of the same family are missed. In other words, such an approach falls short of modelling individual satisfaction within the family as a fully interdependent process. In these circumstances, the following question arises: how does one plan the analysis of the effects of one spouse's level of satisfaction on that of the other in the framework of an integrated context?

[1] See Waite (1995) for a general discussion of the benefits of marriage, and Lucas et al. (2002) for a brief review of the three possible explanations for the association between marital status and subjective well-being.

In an attempt to provide an answer to this question, the present paper models the interdependences of individual preferences within the household by assuming a theoretical framework, namely the collective approach, in which one spouse's satisfaction not only depends on his/her own determinants, but also on the other spouse's variables (Chiappori, 1988, 1992; Browning and Chiappori, 1998; Chiappori et al., 2002).[2] In this way, an analysis of the individual's satisfaction within the household will allow for an examination of the interrelationships between spouses, which, in turn, makes it possible to determine whether the preferences of the family spouses are altruistic or egoistic.

Against this background, the paper first analyses the specific determinants of the income satisfaction levels attained by individuals within the family, with this being chosen as an indicator of subjective well-being, and then goes on to characterise the type of preferences of the family members according to this reported income well-being. With these aims in mind, it begins by offering a brief description of the collective approach adopted in the paper, under the assumption that the family members' preferences are completely altruistic, in such a way that each spouse gives his/her partner's income or leisure equal weight to his/her own variables in the utility function. A particular case of this general situation appears when preferences are egoistic, that is to say, where individual utility simply depends on the individual's own income or leisure. This theoretical framework makes it possible to derive some stochastic formulations which are then estimated for 14 EU countries by using the panel structure which results from the eight waves of the European Community Household Panel-ECHP (1994-2001).

[2] Winkelmann and Winkelmann (1995) use a different framework in order to allow for interactions between spouses, showing that male unemployment has a substantial negative effect on the female spouse's satisfaction. More recently, Winkelmann (2005) has modeled the intra-family correlation of subjective well-being using hierarchical random-effects models, whilst Schwarze and Wilkelmann (2005) have applied this type of utility measurement to the study of altruism between parents and children.

The estimation of family members' satisfaction requires that individual unobservable utility be measured. In this regard, a common approach followed in the literature has been to use ordinal well-being variables as indicators. One worry concerning the statistical analysis of subjective variables is that some people look at life either pessimistically or optimistically, even though there is "really" no difference in their level of well-being, with this heterogeneity being a source of potential bias. However, advances in econometric theory have largely overcome this preoccupation by controlling for individual effects, that is to say, by using conventional fixed or random effects (Clark and Oswald, 2002; Ferrer-i-Carbonell and Frijters, 2004; Senik, 2004).

Moreover, it is well known that individuals' behaviour is orientated towards achieving higher satisfaction levels. As a consequence, all the variables which can be chosen by individuals will be endogenous in the satisfaction regression, in such a way that the majority of estimated parameters obtained by standard regressions are likely to be underestimated. A standard solution to this endogeneity bias, which depends on the degree that individuals can choose these actions in order to be happier, is to use instrumental variables (Powdthavee, 2004a, 2004b; Schwarze, 2004).

Taking into account all these stochastic circumstances, this paper develops an estimation strategy which consists in carrying out four consecutive estimations (pool, fixed effects, random effects and efficient generalized instrumental variables), with the fixed or random effects correcting for the earlier-mentioned heterogeneity and the last estimation providing a typical remedy to the problem of endogeneity bias. After carrying out all these estimations, the strategy selects the one that is statistically most appropriate in every case, by using the LM value as well as two Hausman tests (Baltagi et al., 2003).

The rest of the paper is organized as follows. The theoretical framework is described in Section II, with the data and the stochastic formulation being considered in Sections III and

IV, respectively. Section V is devoted to the empirical results, whilst Section VI closes the paper with a summary of the most relevant conclusions.

II. THE THEORETICAL FRAMEWORK

The traditional or unitary approach to the analysis of the family, which assumes that this, even if it consists of different individuals, acts as a single decision-making unit, has gave way in the literature to an alternative approach which considers that a household can be seen as a micro-society consisting of several individuals with their own rational preferences.[3] This change is due to the fact that the unitary approach suffers from a number of weaknesses, with one of the most relevant being that the assumption that subjective preferences are inseparable from individual behaviour directly leads to an alternative approach, one which explicitly takes into account the notion that a household is a group of individuals.

In response to this and other weaknesses, Chiappori and his co-authors (Chiappori, 1988, 1992; Browning and Chiappori, 1998; Chiappori et al., 2002) propose an approach that has gradually gained more acceptance, namely the collective model, which, based on the assumption that intra-household decisions are Pareto-efficient, considers that the household consists of two working-age individuals, *A* = husband and *B* = wife, whose rational preferences could be represented by altruistic utility functions defined on their own vectors of goods and time, as well as on the other member's vector:

$$u^I = u^I\left(q^A, q^B, q_0^A, q_0^B\right) \tag{1}$$

[3] Early attempts in the literature to account for the fact that households may consist of different individuals with their own preferences are those of Samuelson (1956) and Becker (1974a, 1974b). However, in both cases the authors ended up accepting the traditional approach: in the first case, through an aggregation utility function which is achieved by consensus among the individuals; and, in the second, by assuming the utility function of a benevolent head of the family, who takes into account the preferences of all household members.

where $u^I, I\left(I = A, B\right)$, are strongly quasi-concave, increasing and twice continuously differentiable functions. The arguments are the consumptions q^A and q^B, whose prices are unity, as well as the leisure times q_0^A and q_0^B. Furthermore, the household budget restriction is:

$$q^A + q^B + \omega^A q_0^A + \omega^B q_0^B \leq y^A + y^B + \left(\omega^A + \omega^B\right)T \tag{2}$$

where ω^I denote the individual wages, y^A and y^B are the non-labour incomes for individuals A and B, respectively, and, finally, T is the time endowment.

According to the collective approach, the household demand functions can be derived from an intra-family decision process whose only requirement is that it must lead to Pareto-efficient distributions, with this being formally implemented in the following maximisation problem:

$$\begin{aligned} &\underset{q^A, q^B, q_0^A, q_0^B}{max} \quad u^A\left(q^A, q^B, q_0^A, q_0^B\right) \\ &\text{s. to} \quad u^B\left(q^A, q^B, q_0^A, q_0^B\right) \geq \overline{u}^B \\ &q^A + q^B + \omega^A q_0^A + \omega^B q_0^B \leq y^H + \left(\omega^A + \omega^B\right)T \end{aligned} \tag{3}$$

where $\overline{u}^B$ is some required utility level for individual B, $y^H = y^A + y^B$. From this initial problem, $\overline{u}^B$ can be modified in order to obtain all the Pareto-efficient distributions, with these forming the boundary of the utility possibility set.

Given that it initially assumes that the individual utility functions are strictly quasi-concave and that the budget restriction defines a convex set, the utility possibilities set will be strictly convex. Consequently, all the Pareto-efficient distributions can be characterised as points of a utilitarian social welfare function with positive weights for both household

members in the joint welfare. Thus, the above problem can be expressed in the following terms:

$$\max_{q^A,q^B,q_0^A,q_0^B} \quad \mu(\mathbf{w},\mathbf{y})u^A\left(q^A,q^B,q_0^A,q_0^B\right)+\left[1-\mu(\mathbf{w},\mathbf{y})\right]u^B\left(q^A,q^B,q_0^A,q_0^B\right) \quad (4)$$

$$\text{s. to} \quad q^A+q^B+\omega^A q_0^A+\omega^B q_0^B \le y^H+\left(\omega^A+\omega^B\right)T$$

where $\mathbf{w}=\left(\omega^A,\omega^B\right)$ and $\mathbf{y}=\left(y^A,y^B\right)$. In this optimisation problem, the weights $\mu(\mathbf{w},\mathbf{y})$ and $\left[1-\mu(\mathbf{w},\mathbf{y})\right]$ are the Lagrangian multipliers of problem (3), with these being interpreted as indicators of the bargaining power of the household members in the intra-family distribution process. As can be appreciated from the expressions, the bargaining power depends on the consumption prices, the individual wages and the non-wage income.

Assuming that the function $\mu(\mathbf{w},\mathbf{y})$ is continuous, differentiable and, moreover, zero degree homogeneous, the demand functions that can be obtained as solutions to optimisation problem (4) will also be continuous, differentiable and zero degree homogeneous:

$$q^I=q^I\left(\omega^A,\ \omega^B,\ y^A,\ y^B;\ \mathbf{z}\right) \quad (5)$$

$$q_0^I=q_0^I\left(\omega^A,\ \omega^B,\ y^A,\ y^B;\ \mathbf{z}\right) \quad (6)$$

where $\mathbf{z}$ includes a number of socio-demographic variables.

Substituting now these demands in the initial utility functions (1), the following altruistic indirect utility functions are obtained:

$$v^I=v^I\left(\omega^A,\ \omega^B,\ y^A,\ y^B;\ \mathbf{z}\right) \quad (7)$$

in such a way that utility changes resulting from variations in their arguments allows for the type of individual preferences to be confirmed:

$\frac{\partial v^i}{\partial w^j} > (=) 0 \Leftrightarrow$ ith individual is altruistic (egoistic) with respect to jth individual's wage income

$\frac{\partial v^i}{\partial y^j} > (=) 0 \Leftrightarrow$ ith individual is altruistic (egoistic) with respect to jth individual's non-wage income

III. THE DATA

Bearing in mind that the purpose of the study is to estimate the determinants of husbands and wives' income levels of satisfaction, the data used in this work comes from the eight waves of the ECHP (1994-2001) for each of the 14 sample EU countries.[4] In this present study, families have been selected in which both spouses are aged between 16 and 65 years old. Individuals both with and without children have been included in these households. Those families lacking the required information have been excluded, resulting in a total sample ranging from 31,083 and 33,764 households in France and Spain, respectively, to 9,228 and 2,041 households in Germany and Luxembourg, respectively.

The ECHP includes questions about several subjective aspects of well-being, enquiring into the level of satisfaction that individuals reach with respect to different aspects, such as their income. The specific questions this paper is interested in are: "How satisfied are you with your present situation in the following area? your financial situation". Each of these responses takes values from 1 to 6, moving from not satisfied at all (1) to completely satisfied (6). This satisfaction question is based on individuals' own perception, in such a way that Tables 1 and 2 begin by showing the simple means which are comparable across the populations after assuming the linearity across response.

[4] The ECHP is an extensive, sample-based panel survey in which the same households and individuals are interviewed annually. The data come from a standardised questionnaire and are designed to be cross-nationally comparable (Peracchi, 2002).

Table 1 shows the mean and standard deviation of the dependent variables used in the analysis. The dependent variables are husband and wife income satisfaction (*HusbSatisf*, *WifeSatisf*). From a comparison of the mean values, it can be appreciated that women generally declare higher satisfaction levels than men in the majority of countries, namely Belgium, Denmark, Finland, France, Ireland, Luxembourg, The Netherlands Spain and United Kingdom, with this being a common result in satisfaction studies (Clark, 1997; Sousa-Poza and Sousa-Poza, 2000).

(Table 1)

With respect to the exogenous variables, the study first includes a number of individual characteristics and, secondly, several economic variables. As regards the former, these include the age of the spouses (*HusbAge, WifeAge*), the age difference between the spouses (*AgeDifference*), the education level of each of the spouses (*HusbPrimEduc, HusbSeconEduc, HusbHighEduc, WifePrimEduc, WifeSeconEduc, WifeHighEduc*), as well as two other variables which refer to the presence of children in the household: a dummy variable indicating if there is a child under 12 in the family (*Children<12*), and another indicating the number of children under 16 (*Children<16*).

As regards the variables which refer to the economic situation of the household, these include the wages of both spouses (*HusbWage, WifeWage*), as well as the annual non-wage incomes of both the husband and the wife (*HusbNon-WageInc, WifeNon-WageInc*), the wife's participation in the family income (*WifeParticipation*). Finally, the study also includes a variable which indicates whether the individual is self-employed or a wage-earner (*HusbSelf-Employed, WifeSelf-Employed, HusbWage-Earner, WifeWage-Earner*).

Table 2 shows the mean and the standard deviation of each of the exogenous variables used in the analysis. In every country sample analysed, the age of the husband is higher than

that of the wife. The age difference between both spouses is around 2.5-3 years, with the highest mean value corresponding to Greece, where this age difference reaches 5 years.With respect to the variables that refer to the presence of children in the family, note that around 27% of families have at least one child younger than 12 at home, with this percentage being somewhat lower in Germany, 20%, and higher in Austria, with 35%. However, the mean number of children under 16 does not achieve unity and is, in general, around 0.7, with the highest value appearing in Ireland, with 1.172. As regards the education level, it can be noted that wives show higher percentages than husbands for the primary education level in every country analysed, save for Finland, Ireland and Portugal, where these percentages are similar. By contrast, the percentages of husbands who have attained higher education levels are greater than that corresponding to wives in each sample EU country, save for Finland, France and Portugal.

(Table 2)

From this simple descriptive analysis it also emerges that the husband's mean income per hour is higher than that of the wife's in every sample country. It can also be noted that the highest average values appear in Luxembourg and Finland, 10,317 € for husbands and 6,392 € for wives, respectively, while the lowest are found in Portugal, 2,338 € and 1,277 €/h, respectively. With respect to non-wage annual incomes, the husband's non-wage income is higher than the wife's in every country except Denmark. Luxembourg and Denmark show the highest values for husbands and wives, 8,662.132 € and 4,659.43 €, respectively, while the lowest appear in Portugal and Finland, with 1,725.190 € and 525.783 €, respectively. As regards the wife's participation in family income, the mean is 25% , reaching percentages of 43% and 42% in Denmark and Finland, respectively, while in Spain it is around 18%. Finally, note the higher percentage of self-employed and wage-earner husbands as compared to self-

employed and wage-erarner wives, respectively, in all EU sample countries, save for the case of Finland in this latter employment situation.

IV. THE STOCHASTIC FORMULATION

This section develops the empirical specification and the estimation procedure. In order to describe the empirical specification for the determinants of income satisfaction, it should be recolled that the panel data structure provided by the ECHP permits the application of techniques that help to control for unobservable heterogeneity. In this way, the model which underlyies the observed subjective well-being responses takes the form of linear functions:

$$v_{it}^{I} = \mu_{it}^{I} + \beta_{1}^{A} w_{it}^{A} + \beta_{2}^{B} w_{it}^{B} + \beta_{3}^{A} y_{it}^{A} + \beta_{4}^{B} y_{it}^{B} + \boldsymbol{\delta} z_{it} + \alpha_{i}^{I} + e_{it}^{I} \qquad i = 1, \ldots, N;\ t = 1, \ldots, T;\ I = A,B \quad (8)$$

where the parameters β and $\boldsymbol{\delta}$ are the coefficients that go with the variables; μ and α are constant terms, with μ being the average population and α the individual deviation with respect to this average; and, finally, e are the error terms that are supposed independent, with null mean and constant variance.[5] These equations are estimated independently for both spouses, in such a way that N is the number of families in the sample.

The estimation strategy is made-up of the following steps. First, each equation is estimated separately, considering the aggregated data, that is to say, a pool estimation is carried out. A panel data structure is then used in order to estimate functions, considering individual effects, both fixed and random. As is well known, the difference between the two lies in the fact that, whilst in the case of fixed effects the α coefficients are considered as

[5] Given the ordinal nature of the dependent variable on individual satisfaction, an appropriate regression model would be an ordered probit. However, whilst random-effects ordered probit model is available in standard statistical software packages (Ferrer-i-Carbonell and Van Praag, 2003; Schwarze, 2004; Winkelmann, 2005; Schwarze and Winkelmann, 2005), the fixed-effects ordered probit estimator is not. This is the reason why the present paper uses as approximations both random-effects and fixed-effects regression models, which are perfectly comparable by using habitual tests (D'Ambrosio and Frick, 2004; Ferrer-i-Carbonell and Frijters, 2004; Graham et al., 2004).

fixed values for each individual, in the specification of random effects the specific aspects of each spouse are taken as independent random variables.

Finally, in line with that explained earlier in the paper, consideration is also given to an alternative estimation procedure suggested in the literature, namely the Efficient Generalized Instrumental Variables (EGIV), proposed by Hausman and Taylor (1981)[6]. This estimator uses the individual time averages of the strictly exogenous variables as instruments for the time invariant variables that are correlated with the individual effects. Thus, this procedure allows for the simultaneous control of the correlation between regressors and unobserved individual effects by using instruments. Similarly, it permits the identification of the estimates of the time-invariant covariates, such as education. Additionally, it avoids the insecurity associated with the choice of suitable instruments, since the individual means over time of all the included regressors can serve as valid instruments. Finally, the variance-covariance structure can be taken into account so as to obtain more efficient estimators (see Appendix).

After estimating the four alternative specifications, some appropriate econometric tests allow for the best formulation to be selected in every case. In particular, an LM test indicates if a panel or a pool estimation is preferred. If a panel estimation is selected, then a choice must be made from among the three alternative specifications, with two Hausman tests allowing the best panel estimation to be selected (Hausman, 1978).[7] The first Hausman test (Hausman-1) is the standard to distinguish between the random and fixed effects estimators, whereas the second (Hausman-2) tests the Hausman-Taylor against the fixed effects model.[8]

[6] The recent work by Baltagi et al. (2003) provides information on the suitability of the Hausman-Taylor procedure in a general framework where panel data is available and some regressors are correlated with the individual effects.
[7] See, for details, Hausman and Taylor (1981), Wooldridge (2002) and Baltagi et al. (2003).
[8] The 8.0 version of Stata includes the Hausman-Taylor procedure and is used to obtain the estimates presented in this paper

V. EMPIRICAL RESULTS

This section describes the empirical results, starting with a brief description of the test results that allows for a choice to be made of a particular estimation procedure for each sample country. It then describes the individual and economic determinants of the family member's satisfaction and also explains their type of preferences, altruistic or egoistic.

Thus, Table 3 shows the results for male income satisfaction. First, the LM tests indicate that the pool estimation is not selected in any sample country. Secondly, Hausman-1 tests reveal that the fixed effects estimation is preferred over the random effects and, thirdly, Hausman-2 tests indicate that for all countries, save for Germany, Luxembourg and Portugal, the Hausman-Taylor estimation is preferred with respect to the fixed effects, with this latter estimation being selected in these three countries.

(Table 3)

With respect to the individual characteristics, Table 3 first reveals that the effect of age is significantly positive in the majority of countries, with this result being consistent with those obtained in previous literature (Ahn et al., 2004). Moreover, the effect of the variable which measures the age difference is negative in Austria, France, Greece, the Netherlands and the United Kingdom. The effects of the presence of children vary across countries and also depending on the age, in such a way that the effect is positive if this age is less than 12 years and negative if it is less than 16 years in Greece, Spain and the United Kingdom. For their part, the education variables show that male income satisfaction significantly increases when husbands and wives achieved higher education qualifications, with the former result appearing in the majority of sample countries and the latter appearing in Belgium, France, the Netherlands, Greece and Spain.

Turning to the economic variables, it can be observed that increases in the husband's wage has, according to the normality assumption, a highly significant positive impact on male satisfaction for all sample EU countries, a result that is commonly found in previous studies (Gerdtham and Johannesson, 2001; Frey and Stutzer, 2002; Shields and Wheatley Price, 2005). Moreover, this same positive effect from the wife's wage is also observable in Austria, Denmark, Finland, France, Greece, Italy, the Netherlands, Portugal and Spain. That is to say, these latter countries show altruistic behaviour with respect to wage incomes, in such a way that male satisfaction positively depends on female wages. By contrast, husbands from the rest of the sample countries exhibit egoistic behaviour, with their utilities remaining indifferent to changes in their wife's labour incomes. With respect to non-wage incomes, the husband's variable has a positive effect on male income satisfaction in Austria, Denmark, France, Greece, the Netherlands, Portugal and Spain. This positive effect also appears, according to the altruistic behaviour, from the wife's non-wage income in Denmark, Greece, Portugal and Spain. It is also observable that increases in the woman's share of family income raises the male income satisfaction in Luxembourg, the Netherlands and Spain, but reduces it in Greece and Portugal. Finally, the self-employment variable has a significantly positive effect in Ireland, Italy and Spain, but a negative impact in Austria, Denmark, Greece, Luxembourg and the Netherlands.

Table 4 show the estimations for the female income satisfaction. For every sample country, panel estimation is preferred to the pool one and the fixed effects estimation is selected over the random effects. Moreover, for all countries, save for France, Germany and Greece, that Hausman-Taylor estimation is preferred to fixed effects.

(Table 4)

First note that age has a significantly positive impact on the dependent variable for the majority of countries. Moreover, when the age difference between spouses is greater, female

income satisfaction rises in Ireland, Spain and the United Kingdom. As before, the presence of children have different effects. Thus, if the child is aged less than 12 years, then female satisfaction increases in Greece and Spain, but falls in Denmark, France, Germany, Italy and the Netherlands. For their part, as the number of children aged under 16 living at home rises, satisfaction rises only in France, but falls in Denmark, Greece, Ireland, Spain and the United Kingdom. Furthermore, for the majority of countries, female income satisfaction significantly rises when the husband has achieved higher levels of education.

As regards the economic variables, it can be observed for all sample countries that, according to the altruistic behaviour in wage incomes, a higher husband's wage increases female income satisfaction, with this result also appearing for the wife's wage, according with the normality hypothesis, save for Italy and Luxembourg. With respect to non-wage incomes, the altruistic behaviour also appears in Austria, Finland, France, Greece, Italy, the Netherlands, Portugal and Spain, whereas the normality hypothesis is satisfied in Austria, Greece, Portugal and Spain. An increase in the wife's share of family income is seen to raise female income satisfaction in Italy, Luxembourg and Spain. Finally, the self-employment variable has a significantly negative impact in Austria, Finland, France and Greece.

VI. CONCLUSIONS AND POLICY IMPLICATIONS

This paper has analysed the determinants of household members' satisfaction in a collective family model framework using a sample of 14 EU countries. On the basis of this framework, it has also been possible to study the interrelations that exist between spouses in order to determine the kind of preferences that characterize household members in each of the sample countries. By using country data from the eight waves of the ECHP (1994-2001), four alternative specifications (pool, fixed effects, random effects and efficient generalized

instrumental variables) have been estimated and the most appropriate selected in every case by using an LM value and two Hausman tests.

With respect to the selected formulation, the empirical results show that the IV Hausman-Taylor estimator has been selected in the majority of cases.

As regards the determinants, the expected results have emerged, in line with the recent literature on income satisfaction (Bonke and Browning, 2003; Ferrer-i-Carbonell and Van Praag, 2003;Clark et al., 2004; D'Ambrosio and Frick, 2004). In particular, age has a significantly positive impact on income satisfaction of both spouses for the majority of sample countries. Similarly, income satisfaction significantly increases when individuals achieve higher education qualifications. Moreover, with respect to the economic variables, it appears that increases in individual incomes leads to higher satisfaction levels.

Furthermore, strong evidence has been adduced in support of the interrelations between spouses. More particularly, wives show altruistic behaviour with respect to wage incomes in all the sample countries, whereas this behaviour appears for husbands in Austria, Denmark, Finland, France, Greece, Italy, the Netherlands, Portugal and Spain. With respect to non-wages incomes, wives also reveal altruistic behaviour in more sample countries than do husbands, with the former being the case in Austria, Finland, France, Greece, Italy, the Netherlands, Portugal and Spain, and the latter in only Denmark, Greece, Portugal and Spain.

In the light of these findings, the fact that the Southern European countries (Greece, Portugal and Spain) are the only members of the sample that exhibit altruistic behaviour in both male and female satisfaction variables with respect to the two incomes, would appear to indicate a particular way of family life, one that is characterized by mutual and strong cooperation between the spouses, in the believe that this collaboration will increase the total satisfaction achieved by the household. Thus, these countries appear as clear examples where

cooperative models of family behaviour are fully justified in order to represent the interrelations between spouses.

An understanding of individual satisfaction derived from income within the family could be particularly useful for policy-makers in evaluating socio-economic policies. Thus, the empirical conclusions drawn from this study will hopefully assist in the drafting of such policies that have the final object of increasing the satisfaction levels shown by the spouses within the household.

In addition to the policies focused on improving the education level of individuals, as well as their incomes, the conclusion that wives show altruistic behaviour with respect to both wage and non-wages incomes in all sample countries reveals, among other things, that they assume that their husbands' job exerts a positive influence on their own satisfaction levels, whilst this does not appear for all sample husbands. In these circumstances, policies directed particularly towards increasing male incomes look likely to have a greater impact on the family as a whole than those corresponding specifically to female incomes.

Modeling interrelations within a family on the basis of satisfaction responses constitutes a promising new area of socio-economic research that will probably increase in importance in the near future, given the remaining aspects that are pending analysis. Thus, the consideration of children within the family implies some changes to the framework of interdependences derived from the consideration of spouses alone, with this aspect already being reflected, at least to some degree, in the literature (Becker, 1991; Altonji et al., 1992; Schwarze, 2004; Winkelmann, 2005; Schwarze and Winkelmann, 2005). However, this line of work has yet to be extended to the effects of collusion between children and spouses, where this places one spouse in a non-cooperative position with respect to the other. In this same line, the modeling of ordinal satisfaction responses in habitual data bases (British Household Panel Survey, European Community Household Panel, German Socio-Economic Panel, Panel Study of

Income Dynamics) advises the use of ordered discrete models (Ferrer-i-Carbonell and Van Praag, 2003; D'Ambrosio and Frick, 2004; Schwarze, 2004; Winkelmann, 2005; Fernández-Val, 2005; Schwarze and Wnkelmann, 2005) or threshold and sequential models (Boes and Winkelmann, 2004), which make use of the advantages offered by the panel structure. A final question, one that this paper leaves open, in this agenda for future research on family interdependences with satisfaction data is a more complete analysis of the causality between the decisions of family members. Here, simultaneous models must be specified and estimated by using instrumental variables (Graham et al., 2004; Powdthavee, 2004a, 2004b).

APPENDIX

The Hausman-Taylor method followed in this paper uses as instruments the individual time averages of the variables (the individual's own wage, the presence of children under 12, the number of children under 16, the spouse's own wage, male and female non-labour income, the wife's participation in family income, own age and a dummy that indicates if the individual is self-employed) for the time invariant variables that are correlated with the individual effects (the age difference between the spouses, the individual's own education levels and the spouse's higher education level).

This procedure is implemented in the following steps. First, equations (8) are estimated by pooled Two Stages Least Squares (2SLS), where the set of variables mentioned above act as instruments. Secondly, the pooled 2SLS residuals are used to construct the weights for a Feasible Generalized Least Squares estimator. Thirdly, these weights are used to transform (by quasi-time demeaning) all the dependent variables, explanatory variables and instrumental variables. Finally, the transformed regression is again estimated by pooled 2SLS, where the individual means over time of the time-varying regressors and the exogenous time-invariant regressors are the instruments. Under the full set of assumptions, this Hausman and Taylor estimator is the Efficient Generalized Instrumental Variables (EGIV) and coincides with the efficient GMM estimator

From a technical perspective, the Hausman-Taylor model can be represented in its most general form as follows $v_{it}^{I} = \xi_i + Q'_{it}\,\lambda + S'_i\,\phi + u_{it}$, where $i = 1, \ldots, N$ and $t = 1, \ldots, T$. The S_i are individual time-invariant regressors, whereas the Q_{it} are time-varying. ξ_i is assumed to be iid$(0, \sigma^2_{\xi})$ and u_{it} iid$(0, \sigma^2_{u})$, both independent of each other and among themselves. The matrices Q and S can be split into two sets of variables $Q=[Q_1, Q_2]$ and $S=[S_1, S_2]$ such that

Q_1 is NT x k_1, Q_2 is NT x k_2, S_1 is NT x g_1, and S_2 is NT x g_2. The Q_1 and S_1 are assumed exogenous and not correlated with ξ_i and u_{it}, while Q_2 and S_2 are endogenous due to their correlation with ξ_i but not with u_{it}. Consequently, the individual's own education and the spouse's higher education are included in S_2, since it is time-invariant and endogenous. For its part, the individual's own wage, children under 12 and number of children under 16 are time-varying endogenous variables that are included in X_2.

The authors suggest an instrumental variables estimator which premultiplies the earlier expression by $\Omega^{1/2}$ where Ω is the variance-covariance term of the error component $\xi_i + u_{it}$,[9] and then performs 2SLS using as instruments [P, Q_1, S_1]. P is the within transformation matrix with $Q^* = PQ$ having a typical element $Q^*_{it} = Q_{it} - \bar{Q}_i$ and $\bar{Q}_i$ is the individual mean. As Baltagi et al. (2003) argue, this is equivalent to running 2SLS with [Q^*, $\bar{Q}_1$, S_1] as the set of instruments. If the model is identified, in the sense that there are at least as many time-varying exogenous regressors Q_1 as there are individual time-invariant endogenous regressors S_2, i.e. $k_1 \geq g_2$, then this Hausman-Taylor estimator is more efficient than fixed effects.

[9] The variance-covariance structure of the system can then be represented by $E(UU') = \sigma^2_\alpha (i_T i_T' \otimes I_N) + \sigma^2_v (I_T \otimes I_N)$, where i_T is a Tx1 vector containing ones and I_N (I_T) is the identity matrix of rank N (T) and U is an NTx1 vector of disturbances.

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I. García: Senior Lecturer, Department of Economic Analysis, University of Zaragoza, Zaragoza, Spain. Phone: 34 976 762635, Fax: 34 976 761996, E-mail: igarcia@unizar.es

J.A. Molina: Senior Lecturer, Department of Economic Analysis, University of Zaragoza, Zaragoza, Spain. Phone: 34 976 761818, Fax: 34 976 761996, E-mail: jamolina@unizar.es

M. Navarro: Assistant Lecturer, Department of Economic Analysis, University of Zaragoza, Zaragoza, Spain. Phone: 34 976 764728, Fax: 34 976 761996, E-mail: navarrop@unizar.es

TABLE 1
Descriptive Analysis of the Endogenous Variables (Mean and Std. Dev.)

Variables	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	The Netherlands	Portugal	Spain	United Kingdom
HusbSatisf	4.218	4.131	4.615	4.025	3.685	3.940	3.081	3.699	3.322	4.251	4.562	3.118	3.303	3.814
	(1.36)	(1.31)	(1.17)	(1.21)	(1.23)	(1.23)	(1.18)	(1.48)	(1.24)	(1.32)	(1.05)	(1.04)	(1.35)	(1.18)
WifeSatisf	4.181	4.176	4.629	4.088	3.707	3.914	3.004	3.831	3.254	4.339	4.660	3.007	3.306	3.931
	(1.43)	(1.33)	(1.21)	(1.23)	(1.24)	(1.30)	(1.17)	(1.48)	(1.24)	(1.31)	(1.04)	(1.05)	(1.35)	(1.17)
Number of observations	14,392	14,129	12,083	11,840	31,083	9,228	27,817	11,378	9,376	2,041	24,446	28,803	33,764	14,612

TABLE 2
Descriptive Analysis of the Exogenous Variables (Mean and Std. Dev.)

Variables	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	The Netherlands	Portugal	Spain	United Kingdom
HusbAge	50.374	48.357	47.247	47.529	48.696	49.299	53.203	50.706	51.235	47.081	48.232	51.432	51.129	48.335
	(14.94)	(14.84)	(15.35)	(14.23)	(15.32)	(13.57)	(14.84)	(14.55)	(14.38)	(14.11)	(14.41)	(15.84)	(15.43)	(15.44)
WifeAge	47.339	45.944	44.607	45.364	46.191	46.757	48.221	47.958	47.599	43.932	45.734	48.409	48.380	45.920
	(14.68)	(14.70)	(14.88)	(13.87)	(15.09)	(13.73)	(14.98)	(13.82)	(14.00)	(13.65)	(14.33)	(15.59)	(15.22)	(15.16)
AgeDifference	3.008	2.415	2.641	2.157	2.509	2.549	5.015	2.752	3.641	3.177	2.492	3.010	2.765	2.423
	(4.53)	(4.23)	(4.35)	(4.12)	(4.51)	(4.09)	(4.62)	(4.18)	(4.01)	(4.54)	(3.88)	(4.74)	(3.79)	(4.85)
HusbPrimEduc	0.211	0.308	0.238	0.303	0.382	0.197	0.599	0.530	0.577	0.498	0.241	0.880	0.703	0.433
	(0.41)	(0.46)	(0.43)	(0.50)	(0.49)	(0.40)	(0.49)	(0.50)	(0.49)	(0.50)	(0.43)	(0.32)	(0.46)	(0.50)
HusbSeconEduc	0.711	0.308	0.413	0.410	0.379	0.476	0.215	0.305	0.282	0.295	0.524	0.068	0.133	0.214
	(0.45)	(0.46)	(0.49)	(0.49)	(0.49)	(0.50)	(0.41)	(0.46)	(0.45)	(0.46)	(0.50)	(0.25)	(0.34)	(0.41)
HusbHighEduc	0.070	0.316	0.344	0.281	0.191	0.327	0.184	0.155	0.078	0.205	0.216	0.042	0.164	0.339
	(0.26)	(0.46)	(0.47)	(0.45)	(0.39)	(0.47)	(0.39)	(0.36)	(0.27)	(0.40)	(0.41)	(0.20)	(0.37)	(0.47)
WifePrimEduc	0.385	0.344	0.298	0.282	0.436	0.370	0.678	0.499	0.581	0.646	0.341	0.867	0.749	0.517
	(0.49)	(0.48)	(0.46)	(0.45)	(0.50)	(0.48)	(0.47)	(0.50)	(0.49)	(0.48)	(0.47)	(0.34)	(0.43)	(0.50)
WifeSeconEduc	0.545	0.281	0.366	0.363	0.321	0.508	0.179	0.371	0.280	0.247	0.494	0.066	0.121	0.215
	(0.50)	(0.45)	(0.48)	(0.48)	(0.47)	(0.50)	(0.38)	(0.48)	(0.45)	(0.43)	(0.50)	(0.25)	(0.33)	(0.41)
WifeHighEduc	0.060	0.310	0.330	0.351	0.191	0.117	0.142	0.122	0.059	0.103	0.149	0.042	0.129	0.257
	(0.24)	(0.46)	(0.47)	(0.48)	(0.39)	(0.32)	(0.35)	(0.33)	(0.24)	(0.30)	(0.36)	(0.20)	(0.34)	(0.44)
Children < 12	0.352	0.271	0.296	0.339	0.302	0.199	0.272	0.322	0.285	0.271	0.286	0.281	0.279	0.259
	(0.48)	(0.44)	(0.46)	(0.47)	(0.46)	(0.40)	(0.45)	(0.47)	(0.45)	(0.44)	(0.45)	(0.45)	(0.45)	(0.44)
Children < 16	0.746	0.843	0.756	0.846	0.785	0.667	0.719	1.172	0.650	0.930	0.781	0.703	0.692	0.753
	(1.02)	(1.10)	(1.03)	(1.15)	(1.06)	(0.98)	(0.95)	(1.37)	(0.88)	(1.10)	(1.07)	(0.99)	(0.93)	(1.06)
HusbWage	5.971	6.789	8.336	9.001	6.278	7.432	2.825	6.926	4.465	10.317	7.595	2.338	3.706	5.242
	(7.79)	(11.75)	(7.85)	(9.90)	(9.51)	(8.19)	(4.33)	(21.48)	(4.95)	(10.22)	(9.65)	(3.19)	(4.80)	(6.82)
WifeWage	2.887	4.105	6.170	6.392	3.627	3.323	0.968	2.582	2.011	4.461	4.248	1.277	1.321	3.411
	(4.98)	(5.25)	(21.07)	(9.32)	(6.60)	(5.78)	(2.40)	(5.72)	(3.75)	(7.71)	(7.67)	(2.42)	(3.15)	(6.69)
HusbNon-WageInc	6,149.507	5,985.885	3,857.816	5,738.627	6,366.984	4,944.830	2,088.185	2,605.644	3,456.954	8,662.132	5,088.895	1,725.190	3,129.26	2,968.784
	(8,337.33)	(16,297.34)	(7,496.34)	(15,030.21)	(9,288.09)	(8,586.40)	(3,929.44)	(5,643.54)	(5,699.31)	(11,965.47)	(8,346.27)	(3,750.84)	(5,673.17)	(5,544.07)
WifeNon-WageInc	2,941.705	3,620.359	4,659.143	525.783	2,484.861	2,331.978	728.712	1,091.070	1,316.427	2,195.136	1,611.280	715.548	683.10	1,714.733
	(5,359.75)	(5,923.35)	(5,150.34)	(7,218.24)	(4,422.37)	(3,594.95)	(1,820.82)	(2,197.50)	(725.37)	(4,846.14)	(3,298.23)	(1,837.47)	(1,817.97)	(2,519.39)
WifeParticipation	0.262	0.318	0.430	0.423	0.301	0.268	0.207	0.219	0.235	0.208	0.243	0.284	0.179	0.327
	(0.23)	(0.22)	(0.15)	(0.16)	(0.21)	(0.21)	(0.24)	(0.23)	(0.25)	(0.22)	(0.21)	(0.25)	(0.24)	(0.20)
HusbSelf-Employed	0.105	0.112	0.077	0.176	0.089	0.067	0.323	0.237	0.188	0.086	0.060	0.239	0.155	0.125
	(0.31)	(0.32)	(0.27)	(0.38)	(0.28)	(0.25)	(0.47)	(0.42)	(0.39)	(0.28)	(0.24)	(0.43)	(0.36)	(0.33)
WifeSelf-Employed	0.083	0.055	0.033	0.101	0.034	0.028	0.085	0.028	0.055	0.037	0.031	0.120	0.054	0.045
	(0.28)	(0.23)	(0.18)	(0.30)	(0.18)	(0.17)	(0.28)	(0.16)	(0.23)	(0.19)	(0.17)	(0.33)	(0.23)	(0.21)
HusbWage-Earner	0.529	0.586	0.692	0.530	0.567	0.625	0.318	0.465	0.454	0.631	0.673	0.473	0.460	0.577
	(0.50)	(0.49)	(0.46)	(0.50)	(0.50)	(0.48)	(0.47)	(0.50)	(0.50)	(0.48)	(0.47)	(0.50)	(0.50)	(0.49)
WifeWage-Earner	0.384	0.467	0.645	0.550	0.437	0.477	0.176	0.334	0.272	0.379	0.500	0.357	0.225	0.536
	(0.49)	(0.50)	(0.48)	(0.50)	(0.50)	(0.50)	(0.38)	(0.47)	(0.45)	(0.49)	(0.50)	(0.48)	(0.42)	(0.50)
Number of observations	14,392	14,129	12,083	11,840	31,083	9,228	27,817	11,378	9,376	2,041	24,446	28,803	33,764	14,612

TABLE 3
Male Income Satisfaction

Variables	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	The Netherlands	Portugal	Spain	United Kingdom
Constant	3.737**	4.285**	4.614**	1.426**	2.110**	4.161**	2.059**	-0.355	2.674**	3.418**	2.973**	2.683**	0.974**	3.391**
	(5.02)	(4.57)	(6.42)	(2.87)	(11.20)	(12.47)	(15.61)	(-0.86)	(10.31)	(7.15)	(27.34)	(48.02)	(7.28)	(9.50)
HusbAge	0.019**	0.011**	0.009**	0.023**	0.027**	-0.008	0.004**	0.051**	-0.004	0.007	0.023**	0.003**	0.027**	0.006**
	(10.95)	(3.81)	(3.73)	(5.11)	(16.83)	(-1.16)	(3.42)	(13.21)	(-1.40)	(0.77)	(12.20)	(3.43)	(19.57)	(2.18)
Age Difference	-0.019*	-0.017	-0.008	0.001	-0.018**		-0.019*	-0.016	0.002		-0.013**		-0.003	-0.015**
	-(1.69)	(-1.16)	(-0.66)	(0.10)	(-3.51)		(-1.91)	(-1.21)	(0.21)		(-2.21)		(-0.57)	(-2.12)
Children < 12	-0.031	-0.027	-0.059**	-0.050	-0.052**	-0.084**	0.057**	0.010	-0.057*	-0.045	-0.065**	-0.019	0.098**	0.063**
	(-0.75)	(-1.15)	(-2.00)	(-1.02)	(-2.53)	(-2.36)	(2.54)	(0.30)	(-1.83)	(-0.77)	(-3.25)	(-1.06)	(4.49)	(2.29)
Children< 16	0.018	-0.030	-0.124**	-0.000	0.061**	-0.068	-0.060**	-0.034	-0.036	0.084	-0.009	-0.002	-0.102**	-0.087**
	(0.70)	(-1.47)	(-6.10)	(-0.01)	(4.22)	(-1.37)	(-3.95)	(-1.56)	(-1.49)	(0.99)	(-0.65)	(-0.17)	(-6.59)	(-3.17)
HusbSeconEduc	-1.817	-4.005	-2.033	1.410**	-1.591**		-0.259	2.886**	0.193		-0.651**		1.240	-3.138**
	(-1.61)	(-1.54)	(-1.57)	(2.00)	(-2.68)		(-0.48)	(3.00)	(0.37)		(-3.55)		(1.48)	(-3.32)
HusbHighEduc	6.036**	2.626**	1.104	2.968**	2.595**		6.500**	1.664**	1.762*		1.754**		3.868**	2.555**
	(4.25)	(2.40)	(1.02)	(3.41)	(7.36)		(6.26)	(2.13)	(1.85)		(5.50)		(8.68)	(6.47)
WifeHighEduc	0.684	-1.437**	-0.781	-1.213	1.240**		-4.467**	0.367	0.236		0.591*		-1.787**	-0.510
	(0.34)	(-2.03)	(-0.95)	(-1.59)	(2.97)		(-4.48)	(0.48)	(0.23)		(1.65)		(-4.61)	(-1.43)
HusbWage	0.108**	0.059**	0.108**	0.102**	0.039**	0.108**	0.068**	0.170**	0.275**	0.078**	0.117**	0.057**	0.077**	0.103**
	(12.90)	(9.14)	(12.87)	(2.81)	(8.30)	(5.76)	(18.11)	(8.37)	(5.99)	(3.45)	(13.84)	(17.51)	(20.71)	(6.02)
WifeWage	0.022**	0.008	0.020**	0.070**	0.012**	0.009	0.027**	0.037	0.076*	-0.003	0.029**	0.015**	0.024**	-0.002
	(2.80)	(1.31)	(2.64)	(2.59)	(2.30)	(0.50)	(6.21)	(1.45)	(1.78)	(-0.17)	(3.61)	(4.10)	(5.07)	(-0.14)
HusbNon-WageInc	0.658**	-0.008	0.438*	0.398	0.481**	0.150	0.091**	-0.955	-1.301	-0.019	1.074**	0.060**	0.065**	3.720
	(4.59)	(-0.43)	(1.67)	(1.49)	(2.47)	(0.13)	(12.07)	(-0.28)	(-0.81)	(-0.21)	(2.01)	(5.83)	(6.72)	(1.27)
WifeNon-WageInc	0.295	0.042	1.104**	0.010	-0.386	0.526	0.071**	8.324	3.490	-0.153	-0.777	0.073**	0.104**	3.257
	(1.60)	(0.99)	(3.29)	(0.02)	(-1.15)	(0.20)	(4.60)	(0.87)	(1.18)	(-0.91)	(-0.62)	(3.48)	(3.22)	(0.67)
WifeParticipation	-0.035	-0.082	-0.013	-0.209	-0.045	-0.046	-0.171**	0.039	-0.125	0.819**	0.260**	-0.084**	0.117**	0.006
	(-0.43)	(-1.10)	(-0.14)	(-0.95)	(-0.81)	(-0.39)	(-3.42)	(0.34)	(-0.59)	(2.98)	(4.73)	(-2.12)	(2.12)	(0.08)
HusbSelf-Employed	-0.517**	-0.015	-0.274**	-0.024	0.015	0.032	-0.045*	0.282**	0.096*	-0.428**	-0.145**	0.016	0.078**	0.065
	(-9.54)	(-0.25)	(-5.05)	(-0.42)	(0.34)	(0.28)	(-1.74)	(5.18)	(1.74)	(-2.14)	(-3.84)	(0.82)	(2.57)	(1.46)
LM	7,230.51	10,733.78	4,923.67	1,774.92	17,036.62	1,649.14	6,133.27	4,302.74	2,862.08	461.22	12,134.85	13,890.03	7,825.20	2,928.44
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Hausman 1	234.69	119.30	129.59	62.89	619.40	273.50	653.27	205.41	102.35	90.01	395.63	499.27	753.30	314.91
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Hausman 2	2.69	2.38	7.58	2.90	0.76	21.31	16.55	1.24	6.34	18.94	10.66	17.16	12.98	4.97
	(0.9755)	(0.9839)	(0.577)	(0.9683)	(0.9998)	(0.0113)	(0.0562)	(0.9986)	(0.7053)	(0.0257)	(0.2996)	(0.0463)	(0.1636)	(0.8367)
Selected estimation	HT	HT	HT	HT	HT	FE	HT	HT	HT	FE	HT	FE	HT	HT
Number of observations	14,392	14,129	12,083	6,236	31,082	9,228	27,817	11,378	9,376	2,041	24,446	28,803	33,764	14,612

Note: t ratio in brackets. *: indicates individual significance at the 10% level. **: indicates individual significance at the 5% level. ***: indicates individual significance at the 1% level.

TABLE 4
Female Income Satisfaction

Variables	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	The Netherlands	Portugal	Spain	United Kingdom
Constant	4.461**	4.012**	4.449**	1.928**	2.423**	3.690**	2.614**	0.387	1.867**	4.865**	3.105**	2.377**	1.639**	2.478**
	(13.37)	(8.35)	(14.36)	(3.79)	(23.38)	(11.33)	(41.69)	(1.01)	(6.89)	(5.11)	(26.34)	(33.10)	(15.35)	(9.28)
WifeAge	0.004**	0.011**	0.011**	0.021**	0.024**	0.001	0.003**	0.043**	0.003	-0.001	0.022**	0.004**	0.018**	0.015**
	(2.24)	(3.81)	(3.90)	(4.53)	(10.99)	(0.15)	(2.31)	(10.46)	(0.76)	(-0.11)	(12.08)	(4.07)	(12.44)	(5.02)
AgeDifference	-0.002	-0.008	0.004	0.018*				0.016*	-0.001	0.014	0.009	0.005	0.015**	0.012**
	(-0.16)	(-0.74)	(0.42)	(1.68)				(1.69)	(-0.11)	(0.35)	(1.25)	(1.01)	(2.36)	(2.44)
Children < 12	-0.012	-0.015	-0.102**	-0.074	-0.063**	-0.066*	0.055**	-0.033	-0.069**	-0.005	-0.067**	0.003	0.056**	-0.044
	(-0.28)	(-0.62)	(-3.24)	(-1.48)	(-3.06)	(-1.77)	(2.42)	(-0.94)	(-2.06)	(-0.09)	(-3.50)	(0.19)	(2.46)	(-1.46)
Children < 16	0.025	0.028	-0.077**	0.002	0.092**	-0.011	-0.063**	-0.058**	0.007	0.130	-0.011	-0.009	-0.055**	-0.090**
	(0.93)	(1.33)	(-3.54)	(0.05)	(6.42)	(-0.22)	(-4.17)	(-2.53)	(0.26)	(1.61)	(-0.84)	(-0.71)	(-3.40)	(-3.10)
HusbHighEduc	5.822**	2.369**	1.528**	2.054**				0.551	0.964	5.493*	2.338**	6.372**	4.693**	2.513**
	(3.77)	(3.55)	(3.22)	(3.69)				(0.78)	(1.27)	(1.76)	(6.09)	(8.01)	(10.41)	(9.16)
WifeSeconEduc	-2.368**	-3.433**	-2.281**	1.131*				2.499**	1.063**	-7.687*	-0.704**	-1.457**	-1.915**	-1.011
	(-3.13)	(-2.29)	(-4.15)	(1.73)				(3.18)	(2.90)	(-1.85)	(-2.76)	(-2.14)	(-2.33)	(-1.46)
WifeHighEduc	2.547	-1.435**	-0.811	-0.627				0.941*	-0.058	-1.360	0.589	-0.204	-1.261**	-0.135
	(1.15)	(-3.25)	(-1.52)	(-1.11)				(1.66)	(-0.05)	(-0.48)	(1.51)	(-0.24)	(-3.54)	(-0.48)
HusbWage	0.036**	0.040**	0.056**	0.078**	0.016**	0.062**	0.040**	0.141**	0.264**	0.049**	0.088**	0.029**	0.061**	0.108**
	(4.14)	(6.03)	(6.31)	(2.06)	(3.43)	(3.14)	(11.52)	(6.70)	(5.52)	(2.31)	(10.69)	(9.13)	(16.06)	(5.98)
WifeWage	0.059**	0.042**	0.078**	0.067**	0.048**	0.083**	0.034**	0.100**	0.000	-0.013	0.062**	0.039**	0.033**	0.050**
	(7.04)	(6.30)	(9.67)	(2.38)	(8.93)	(4.45)	(7.12)	(3.67)	(0.01)	(-0.71)	(7.94)	(10.93)	(6.69)	(2.82)
HusbNon-WageInc	0.278*	0.014	-0.262	0.495*	0.610**	-1.395	0.070**	2.895	3.867**	0.062	0.932*	0.041**	0.057**	3.677
	(1.86)	(0.71)	(-0.94)	(1.80)	(3.10)	(-1.12)	(9.20)	(0.82)	(2.28)	(0.73)	(1.78)	(4.00)	(5.55)	(1.25)
WifeNon-WageInc	0.580**	-0.016	0.664*	-0.296	0.132	1.433	0.048**	8.378	-0.040	-0.222	-0.105	0.079**	0.081**	0.324
	(3.00)	(-0.36)	(1.86)	(-0.65)	(0.38)	(0.51)	(3.11)	(0.85)	(-0.01)	(-1.38)	(-0.08)	(3.81)	(2.38)	(0.06)
Wife Participation	0.035	0.060	-0.097	0.013	0.007	-0.022	0.068	-0.051	0.845**	0.549**	0.073	0.030	0.246**	0.051
	(0.42)	(0.77)	(-0.95)	(0.06)	(0.12)	(-0.18)	(1.35)	(-0.43)	(3.76)	(2.09)	(1.36)	(0.75)	(4.24)	(0.55)
WifeSelf-Employed	-0.521**	-0.061	0.031	-0.299**	-0.155**	-0.023	-0.114**	-0.058	0.119*	-0.171	-0.059	0.005	-0.062	0.004
	(-9.39)	(-0.85)	(0.44)	(-3.94)	(-2.50)	(-0.17)	(-3.22)	(-0.53)	(1.90)	(-0.95)	(-1.40)	(0.23)	(-1.50)	(0.06)
LM	7,847.26	10,203.64	4,317.63	1,638.12	18,009.21	1,787.88	6,286.51	4,470.59	2,861.98	473.10	12,447.21	16,166.02	8,706.36	2,534.99
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Hausman 1	246.85	92.94	124.69	59.27	443.85	186.34	613.39	129.07	80.35	54.63	346.97	359.04	603.36	230.08
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Hausman 2	0.69	5.01	9.32	1.99	157.40	17.81	29.53	0.90	5.71	0.16	11.73	12.33	1.58	2.24
	(0.9999)	(0.8331)	(0.4082)	(0.9916)	(0.0000)	(0.0374)	(0.0005)	(0.9996)	(0.7684)	(1.0000)	(0.2289)	(0.1955)	(0.9965)	(0.9871)
Selected estimation	HT	HT	HT	HT	FE	FE	FE	HT	HT	HT	HT	HT	HT	HT
Number of observations	14,392	14,129	12,083	6,236	31,083	9,228	27,817	11,378	9,376	2,041	24,446	28,803	33,764	14,612

Note: t ratio in brackets. *: indicates individual significance at the 10% level. **: indicates individual significance at the 5% level. ***: indicates individual significance at the 1% level.